

Eco7424: Econometric Methods I Spring 2019

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Class time and classroom: T/Th, 12:30p-1:45p, PC 449

Office hours: T/Th 11a-12p, or by appointment, DM 318A

Course website: <http://canvas.fiu.edu/> (if you have registered for this course, enrollment into Canvas course shell is automatic.)

Teaching Assistant: Adir Junior, amanc020@fiu.edu

Note: The prerequisites for this course are formal courses in Calculus, Linear Algebra, and Mathematical Probability and Statistics.

Course Objectives

This is the first course of the graduate econometrics sequence. It will focus on the formulation, estimation, and evaluation of basic linear econometric models. This will include: properties of OLS (Ordinary Least Squares) estimators, asymptotic theory, hypothesis testing, violations of OLS classical assumptions, and instrumental variable estimation.

Learning Outcomes

By the end of this course you will be able to perform OLS regressions, understand properties of estimators, and assess the appropriateness of different estimation specifications based on the properties of the data. Additionally, you will be able to apply asymptotic theory, test hypotheses, and understand the idea of instrumental variable estimation. You will be able to use Python to conduct basic empirical analysis.

Required textbooks:

Greene, William, *Econometric Analysis*, 2008, 7th Edition, Pearson/Prentice Hall (see the company website: <http://people.stern.nyu.edu/wgreene/Text/econometricanalysis.htm>, for related materials of the textbook).

Stock, James H. and Mark W. Watson, *Introduction to Econometrics*, 2010, 3rd Edition, Addison-Wesley (this is an advanced undergraduate textbook that will bridge the transition from undergraduate to graduate econometrics; if you have not used this book in your undergraduate study, then it is required.)

Lectures will primarily draw on materials from Stock & Watson (SW henceforth) and Greene.

Due to the rising popularity of Python and its potential, starting this semester, we will study how to conduct some foundational econometric operations in Python. A nice educational website for this purpose is [Lectures in Quantitative Economics](#) (by Thomas Sargent and John Stachurski), and we will follow closely on the parts therein related to econometrics. (Since we are not really teaching in a computer lab, you'd have to bring in your own laptop in Python sessions.)

Course outline (the dates are tentative and subject to adjustments):

Week 1 (1/8, 10) Introduction and Overview of Simple Linear Regressions (SW Chap. 4-5)

Week 2 (1/15,17) Overview of Multiple Linear Regressions (SW Chap. 6)

Week 3 (1/22) 1st Python lab session

(1/24) OLS: model and assumptions (SW Chap. 6; Greene Chap. 2)

Week 4 (1/29, 31) Variations of OLS functional form (SW Chap. 8; Greene Chap. 6)

1st Homework Assignment assigned

Week 5 (2/5, 7) OLS: model and estimation (SW Chap. 6; Greene Chap. 3)

Week 6 (2/12, 14) Properties of OLS estimators (SW Chap. 6; Greene Chap. 4)

Week 7 (2/19, 21) OLS: finite-sample statistical inference (SW Chap. 7; Greene Chap. 4)

Week 8 (2/26) Basic asymptotic theory (Greene Appendix D)

2nd Homework Assignment assigned

(2/28) 2nd Python lab session

Week 9 (3/5, 7) Large-sample properties of OLS estimators (Greene Chap. 5)

Week 10 (3/12, 14) (Spring break, no class)

Week 11 (3/19) OLS: large-sample statistical inference (Greene Chap. 5)

(3/21) Violations of classical assumptions in OLS: measurement error and omitted variables (SW Chap. 9)

Week 12 (3/26) (Cont.) Violations of classical assumptions in OLS: measurement error and omitted variables (SW Chap. 9)

3rd Homework Assignment assigned

(3/28) 3rd Python lab session

Week 13 (4/2, 4) Endogeneity and Instrument Variables Regression (SW Chap. 12)

Week 14 (4/9) IV and 2SLS estimation (Greene Chap. 8)

(4/11) Treatment Effects and Difference-in-Difference (Greene Chap. 6)

Week 15 (4/16) (Cont.) Treatment Effects and Difference-in-Difference (Greene Chap. 6)

(4/18) 3th Python lab session

Final exam in the Final Week (Time and Location TBA)

Grading: Your overall grade (100%) for this course is comprised by:

Installing Python and Jupyter Notebook before 1st Python lab session: 5%

Homework Assignment: 20% x 3 = 60%

At least 75% of students finishing online course evaluation before Final Week: 5%

Final Exam: 30%

Homework Assignments: Each student must submit an individual solution to each homework assignment. Each student can work with any other enrolled student on homework assignments, and should indicate the partner's name on the solution. Whether working solo or with another student will not affect your grades, but each group should not involve more than two students. There should be no formal or informal collaborations between groups. You could change your groups between homework assignments.

Final Exam: It is closed-book, closed-computer (or tablet, or smartphone), yet each student is allowed to bring in two-page (either one two-sided page, or two one-sided pages), print-paper size formula sheet as assistance during the exam.

Other general notes:

1. The Code of Academic Integrity applies to this course (<http://www.fiu.edu/~oabp/misconductweb/2codeofacainteg.htm>). **Zero tolerance for cheating:** no excuse.
2. You are welcome to come in person or call in during the office hours, when you have general or specific questions. Email reply is subject to the instructor's discretion.